

ANTS ASSOCIATED WITH APIARIES IN THE NEW ENGLAND STATES

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Many ants are inordinately fond of sweets and seek out places where such dainties may be found, such as the floral and extra-floral nectaries of plants, the sugary excretions of aphids, or even preserves on the kitchen shelves. One may therefore expect that apiaries, where sweets are accumulated in great abundance, will not escape the attention of foraging ants.

During the past two years the writer has made a study of the species of ants which are found in or near beehives in the New England States, with the object of assessing the possible damage done to apiculture by ants. The observations were made at my own apiary, located in a two-acre garden in Dedham, Massachusetts.

Root and Root in their well-known popular book, "ABC and XYZ of Bee Culture," have recorded some interesting observations which agree, for the most part, with my own. In many instances, however, the interpretations put forward by these authors are anthropomorphic, and not in accordance with the behavior pattern of either bees or ants.

The ants which are found in or near beehives fall into three groups; those which use the hives as temporary or permanent shelters, those which prey on living bees, and finally those which rob the bees of stored honey. The first group is of little or no economic importance. In our climate at least, ants rarely attempt to nest in hives occupied by bees; only empty hives are occasionally used as nesting sites by ants. The following freshly dealated queen ants, hunting for nesting sites, have been taken from empty hives: *Camponotus herculeanus* subsp. *pennsylvanicus* and var. *novoboracensis* (the subsp. *pennsylvanicus* is known as the "black carpenter ant" and the variety *novoboracensis* may be called the "redbreasted carpenter ant"). *Crematogaster lineo-*

lata subsp. *cerasi* (cf. Jane Enzmann, 1946, JOURNAL OF THE NEW YORK ENTOMOLOGICAL SOCIETY, 54: 89-97) was found on several occasions in empty hives. In one case (observed in New Jersey) a flourishing colony of *C. lineolata* had established its nest between the storm cover and the inner cover of a hive. Workers of this ant colony were also found on the combs of this rather weak bee colony, pilfering stored honey. In another case a very small nest of *Solenopsis molesta*, (the "thief ant") was found in a hive, but the nest had disappeared a few days later. This association with bees was, in the writer's opinion, more or less accidental, for although this ant will not refuse sweets, it seems to prefer fatty substances for food.

Several species of ants were often found nesting near bee-hives, including *Lasius* ssp. (the "lawn ant"), and *Aphænogaster*. Both of these forms are rather fond of sweets. *Lasius* will quickly overrun a partly filled or damaged honey comb left outside the hive on the ground, but neither *Lasius* nor *Aphænogaster* have been observed entering hives in order to rob the bees. *Formica fusca* (the "gray ant") and *F. sanguinea* (the "blood-red slavemaker") likewise make their appearance when honey combs are exposed, but have not so far been seen inside inhabited hives. It is obvious that none of these species cause any serious damage. *Camponotus* might conceivably do damage to the wood of the hives, but then, this ant is so large that it cannot easily escape detection by the bees, who make short work of the intruders.

The second group of ants *i.e.*, those that prey on living bees, is of no importance in our climate. However, in the southern states and especially in the tropics this group is noxious and great precautions have to be taken to exclude ant pests from the hives. Root and Root (*loc. cit.*), quoting O. O. Poppleton (in "Gleanings"), state that in late fall (September to December) many colonies of bees in Florida are lost to the depredations of "red ants," nearly half an inch in length, of nocturnal habits, that nest ordinarily in decaying wood. According to these writers the ants may battle the bees for hours or days and the ground surrounding the hives may be covered with dead ants and crippled bees. The battle is said to end always in favor of the ants,

which finally kill all the bees and occupy the hive. Unfortunately, Poppleton's account does not give enough descriptive data for identification of the ant in question; it might be a form of *Camponotus*.

In the tropics several ants species attack bees. The army ants (*Eciton* spp.) are perhaps the worst killers and may clean out a beehive in a matter of minutes. Root and Root cite the following account by Poppleton relating to ants' forages in beehives: "the worst feature is their readiness to travel, so that, when one destroys their nest, there is no assurance that the apiary is safe from their attack. Another bad feature is their habit of traveling by night; in fact, nearly all their depredations are made in the dark." This account suggests *Eciton* or "army ants." Beekeepers in tropical countries protect their hives by placing them on platforms supported by posts which are ringed with cups filled with coal tar, creosote, or crude petroleum.

The last group of ants includes the species which invade hives occupied by living bees in order to rob them of honey. The only species of any importance in the northern states is *Prenolepis imparis*. This ant is a bold honey thief and marches right into the entrance of the hives, emerging later with the gaster greatly distended with stolen honey. In some cases, especially when a colony is weak, *Prenolepis* forages in files, boldly marching past the guardian bees which rarely pay any attention to them, so that they may steal appreciable amounts of honey during a season. One such hive which had been set aside during 1944 for the purpose of determining the amount of damage, at the end of the honey gathering season, contained less than two pounds of honey, while an equally weak colony, which had been protected with spray on the ground, had collected nearly 80 pounds. Sometimes the guardian bees at the hive entrance will notice larger ants, for instance *Camponotus*, seize them and fly high in the air, carrying them a few feet from the hive and dropping them on the ground unharmed.

The repletes have their abdomens swollen with honey and often carry so much that they are barely able to waddle along. The repletes of *Prenolepis* are obliged to regurgitate their honey within a short time. Isolated ants kept overnight in a closed container,

usually disgorge their honey and empty their crops. A few of them, which for some reason do not regurgitate, actually burst. *Prenolepis* is therefore not a true "honey ant," a fact indicated by Wheeler, and is not as highly specialized as *Melophorus*, *Leptomyrmex*, *Plagiolepis*, *Camponotus inflatus*, *Crematogaster inflata* and *Myrmecocystus*. The last named, the "true honey ant," is capable of storing very large amounts of sweets for a considerable length of time in its gaster. The repletes of this ant are unable to move and remain hanging from the ceiling of the nest, forming living honey pots. The crop filling is retained by the repletes of *Myrmecocystus* (the honey ants of Texas) for long periods of time and can be distributed to the other nest mates during the lean season, when the outside world is sun parched and no food is available.